

## **LOCK INSTALLATION KIT**

### **CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application is a continuation-in-part of United States Application No. 10/372,896, filed February 26, 2003, and claims priority from United States Provisional Application No. 60/359,454, filed on February 26, 2002, the contents both of which are expressly incorporated herein by reference.

### **FIELD OF THE INVENTION**

[0002] The present invention relates generally to tool kits for specific tasks. More particularly, the present invention relates to a tool kit for lock installation, having all necessary tools for the task in one convenient kit, and especially to a template assembly for marking the proper place to drill holes in a door for the lock installation.

### **BACKGROUND OF THE INVENTION**

[0003] Lock installation kits are used to mark the locations of the holes to be drilled on a door that requires cylinder locks, double-cylinder locks, deadbolts, and latch bolts. Doors, depending on whether they are interior or exterior doors, have different thicknesses (typically 1.375" for interior doors, and 1.750" for exterior) and the height of the lock, relative to the bottom of the door, is set at a standard distance (typically 40").

[0004] There are various guides and templates currently being used to mark the locations of these holes, but they differ considerably, depending on the scope of the job and the end user's capabilities. In the case of a large construction, where repetitive installations are required, a contractor uses a complicated and expensive jig. The jig is located over the position at which the lock has to be installed, clamped in place, and the holes drilled, using the jig as a drill guide. Holes for the cylinders are made using a hole saw/mandrel combination, and the holes for the latch bolts made by a spade/wood bit. The jig is then removed and the lock installed. However, a do-it-yourself person installs locks on a very infrequent basis, and would not invest in a rarely used and expensive jig.

[0005] Locks that are sold in the retail business are individually packaged, and contain a paper/cardboard template showing the location of the holes, instructions for placement, and the installation of the locks. Traditionally, the paper piece is placed at the location and taped in place. This process requires the assistance of a further person and can be very frustrating as the tape has a tendency of lifting, resulting in the re-placement of the template, and re-affixing, sometimes inaccurately. In addition, the paper template must often be folded along lines to adjust to the different door widths and lock-set locations. The holes are then drilled through the paper, then into the door, making the template a single-use device. In addition, such templates do not provide an accurate means for locating the striker plate on the door jamb adjacent to the lock. Often, the striker plate location is merely determined by visual inspection. This can lead to inaccurate striker plate positioning, resulting in difficulty latching the door with the installed lock.

[0006] Thus, it is desirable to provide a template assembly for lock installation that is accurate, simple to use, re-usable, easy to attach to a door, and that remains in place once applied.

## **SUMMARY OF THE INVENTION**

[0007] It is an object of the present invention to obviate or mitigate at least one disadvantage of previous lock installation kits and lock installation templates.

[0008] In a first aspect, there is provided a lock template assembly comprising an end template, at least one side template connected to the end template, biasing means cooperating with the at least one side template, and marking means, such as guide holes, disposed in at least one side template for providing cylinder hole location, or striker plate location. The base portion has at least one center hole for alignment with a center line of a door edge when positioned on a door. The biasing means permits the template assembly to accommodate door edges of varied widths and to hold the at least one side template substantially flush to a respective door surface.

[0009] In one embodiment of the present invention, the end template is a generally U-shaped spring clip having two side portions forming the biasing means. Preferably, the U-shaped spring clip applies substantially equal and opposing forces to the door to align the base

portion with the center line. Two side templates are preferably provided in this embodiment. They can be pivotably connected to the side portions, or integrally formed to the end template. When pivotably connected, spring means can be provided at the connection to bias the side portions to a lie flush with respect to respective door surfaces. In a further embodiment, the biasing means is a single spring clip attached to the end template opposite to the at least one side template. Non-marking protection caps can be attached to the side templates to protect door surfaces.

**[0010]** In a further aspect, the present invention provides an integrally formed lock template assembly. The assembly comprises an end template including a base portion with at least one center hole for alignment with a center line of a door edge when positioned on a door; at least one side template integrally formed with the end template and substantially perpendicular to the base portion; biasing means, integrally formed with the end template, cooperating with the at least one side template to accommodate door edges of varied widths and to hold the at least one side template substantially flush to a respective door surface; and marking means disposed in at least one side template for providing cylinder hole location. Preferably, the end template has two side portions forming a generally U-shaped spring clip, and two side templates depend from each of two side portions of the end template, respectively.

**[0011]** In yet another aspect, there is provided a lock installation kit comprising a set of lock installation tools, and a lock template assembly, as described above, forming a lid to a tool box containing the set of lock installation tools.

**[0012]** In yet another embodiment, there is provided a lock template assembly comprising an end template, at least one side template, biasing means and marking means. The end template includes a base portion with at least one center hole for alignment with a center line of a door edge when positioned on a door. The side template is pivotably connected to the end template, and the biasing means cooperate with the side template to accommodate door edges of varied widths and to hold the at least one side template substantially flush to a respective door surface. The marking means are disposed in the at least one side template for marking a location of a striker plate on an adjacent door jamb when the side template is folded

back against the door jamb. Striker plate locating marks can either be achieved through the use of guide holes in the side template or marks on the edges of the end template.

[0013] In yet another aspect, the present invention provides a lock template assembly comprising an end template, at least one side template connected to the end template, biasing means cooperating with the at least one side template, and marking means, such as guide holes, disposed in at least one side template for providing cylinder hole location, or striker plate location. The base portion has at least one center hole for alignment with a center line of a door edge when positioned on a door. The biasing means permits the template assembly to accommodate door edges of varied widths and to hold the at least one side template substantially flush to a respective door surface. To facilitate assembly of the lock template assembly, self-alignment means are provided on at least one of the biasing means and the at least one side template to ensure proper alignment between the at least one of the biasing means and the at least one side template.

[0014] Other aspects and features of the present invention will become apparent to those ordinarily skilled in the art upon review of the following description of specific embodiments of the invention in conjunction with the accompanying figures.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

[0015] Embodiments of the present invention will now be described, by way of example only, with reference to the attached Figures, wherein:

Fig. 1 is a top plan view of a lock installation kit according to the invention, showing the tools in place in a tool case;

Fig. 2 is an elevational side view of a template assembly according to a first embodiment of the invention, showing the support clips and side templates folded to the operating/storage position;

Fig. 3 is a top plan view of the template assembly of Fig. 3;

Fig. 4 is a plan side view of the template assembly of Fig. 3;

Fig. 5 is an elevated side view of the side template according to the first embodiment of the invention, seen from the outside of the template;

Fig. 6 is a plan side view of a support clip according to the first embodiment of the invention;

Fig. 7 is a top plan view of the template assembly according to the first embodiment of the invention, showing the flexible opening of the end template using the side templates/support clips when attaching the template assembly to a door edge;

Fig. 8 is an elevational side view of the template assembly according to the second embodiment of the invention, showing the side templates removed from the support clips and some support clips removed from the end template;

Fig. 9 is a plan side view of a third embodiment of the template assembly of the invention;

Fig. 10 is a plan side view of a side template according to the fourth embodiment of the invention;

Fig. 11 is a perspective view of a further embodiment of a template assembly according to the invention;

Fig. 12 is a top plan view of a lock installation kit with a template assembly in a folded position, according to a further embodiment of the present invention;

Fig. 13 is a top plan view of the lock installation kit of Fig. 12, with the template assembly in an unfolded position; and

Fig. 14 is a side view of the template assembly of the embodiment of Figs. 12 and 13 attached to a door edge.

## **DETAILED DESCRIPTION**

[0016] Generally, the present invention provides a method and system for marking locations on a door where holes have to be drilled for installing a lock on the door. The invention also provides an installation kit, including a toolbox and the tools necessary to install a lock, incorporating a lock template assembly.

[0017] Fig. 1 shows one embodiment of an installation kit 1 according to the invention. A plurality of tools are contained in a tool box 2, advantageously having a hanging tab 3, or other display means. A template assembly 4 according to the invention is one of the preferred tools, examples of other tools are hole saw 5, chisel 6, spade drill bit 7, ordinary

drill bit 8, set-depth drill bit 9 and pencil 10. Any other tool, which would be necessary for a particular hole-making project, can be included in the tool kit. All the components necessary for lock installations can thus be stored in one convenient carrying case.

[0018] A first embodiment of a template assembly 4 according to the invention is shown in Figs. 2 to 6. The assembly has an end template 11, which is a generally U-shaped spring clip having a base portion 12 and side portions 13 that depend from the base portion 12. The base portion 12 is preferably a flat section with a width, measured along its open edge that is wider than any standard door stile, or any other edge to which it is intended to be clamped. The side portions 13 are preferably angled towards each other by an inwardly biased connection to base portion 12. Holders 14 are provided at free ends of the side portions 13 to hold ends 16 of support clips 15 by the ends being slid or snapped into the holder. The support clips 15 are shaped to correspond to grooves 17 of side templates 18, so that the support clips securely hold the side templates when snapped into the grooves 17. The side templates 18 have guide holes 19, which are used by an operator as a jig to mark desired drill hole locations, or to act as a drill guide. For example, the guide holes 19 can be used to locate the hole for the lock cylinder depending upon what type of lock is desired to be installed. In an alternate embodiment, guide holes 19 can be replaced by other suitable marking means, as are known to those of skill in the art. Further, by folding the side template 18 adjacent the door jamb, the slot-shaped guide hole 19, or other marking means, can be advantageously used to mark the height and location of the striker plate on the adjacent door jamb. This ensures accurate positioning of the striker plate in relation to the door lock.

[0019] Preferably, tabs 20 are provided on holders 14 to urge the support clips to either a marking or storage position, in which the template assembly can be used on a door for marking a hole (or stored in the tool case), or a door attaching position, as shown in Fig. 7, in which the side portions 13 can be biased away from each other, using the support clips 15 as levers and the junction between base 12 and side portions 13 as the fulcrum, to secure the template assembly on a door edge. In addition to merely clamping the template assembly to the door, holes can be provided, in the end template 11, to receive temporary fasteners, such as screws or nails. Preferably, the location of these additional temporary fastener holes

coincide with the holes necessary to secure the striker barrel assembly cover plate once the template is removed. Coil springs can also be provided at the connection of support clips 15 to holders 14 to more positively urge side templates 18 into either the marking or attaching position. The base portion 12 preferably has a center hole or other marker, which can be aligned with the center line of the door edge when the template assembly is attached to a door edge. The center hole 21 can also be used to mark the location of the latch bolt hole. Striker plate locating marks can either be achieved through the use of guide holes in the side template or marks on the edges of the end template.

[0020] As will be apparent to those of skill in the art, end template 11 is essentially a spring clip that applies equal force from both sides. Advantageously, this tends to ensure that the template assembly 4 is held in central alignment with the door stile when the base portion 12 is placed flush against the door stile surface. Thus in use, the center hole 21 will generally coincide with the center line of the door edge.

[0021] The support clips 15 are advantageously formed from rigid but bendable wire, and conform to a predetermined shape. End template can be made of any suitable material, or combination of materials, having inherently resilient or spring-like characteristics, such as spring steel, resilient thermoplastics, or other suitable material. Preferably, end template 11 is manufactured from a material having sufficient strength to permit the end template 11 to be opened and closed without fracturing or bending the end template or the side templates, and sufficient ductility to permit repeated operation. An optional plastic or soft material liner can be provided to be used between the open ends of the end template and the door to avoid marking the surface. Alternately, interior surfaces of the end template and/or side templates, can be provided with a ribs or protection caps made of a non-marking material, such as rubber. Such ribs or protection caps can also advantageously provide added grip to the template assembly. The location hole 21 is centrally punched into the back surface of the end template and the edges are rolled to accept bent portions of the support clips 15. The rolled sections advantageously have a raised ridge on the edges closest the center line. This acts as a cam detent that prevents the support clip 15 from remaining in a "neutral" position, but urges it to a full-closed, or a fully-open position.

**[0022]** The side templates **18** can be made out of sheet metal, molded plastic, or a flat plastic sheet. They can have a recess to accept the support clips **15**, clips into which the support clips **15** snap, or have the support clips insert-molded into the side templates. In order to prevent undue looseness of the components of the template assembly, and, hence, unacceptable misalignment of the assembly when attached to a door for marking hole locations, at least one of the side template, the end template or the support clips is designed to limit component articulation to only one axis per side template, and to provide self-alignment when the template is assembled or manufactured. Tabs **20** also aid in providing self-alignment by maintaining the position of the side templates relative to the end template. To further aid in precision alignment of the components of the template assembly, particularly where the components are made of plastic materials, self-aligning features, such as crush ribs or interference shoulders, can be provided on one or more of the components.

**[0023]** Fig. 7 shows the method of attachment of template assembly **4** to a door edge. Generally, the template assembly **4** is removed from the lock installation kit. The side templates **18** with the embedded support clips **15**, are bent backwards to the back of the end template **11**. The side templates **18** act as levers to open the end template **11** to facilitate installation on the edge of the door. The template assembly **4** is then slid over the door edge **D**, by fitting the door edge between the side portions **13** until base portion **12** is flush with the door stile, and the center hole **21** is aligned with the center line of the door stile. The side templates **18** are thereafter pivoted to the operating position, i.e. flush with the door sides, and, in accordance with the desired guide holes **19**, the required hole location positions are marked on the door, or the holes are directly drilled using the guide holes as a drill guide. Each side template **18** preferably includes multiple guide holes to accommodate different lock sizes, different door sizes, and/or different lock types.

**[0024]** Once the hole locations are marked on the door, or drilled, the side templates **18** can then be folded out, or otherwise placed adjacent to the door jamb. A mark can then be made on the side of the door jamb through one of the guide holes **19**, such as the slotted hole, to indicate the height and location of the striker plate on the door jamb. The striker plate can then be accurately located on the face of the door jamb, and will coincide precisely with the



latch or dead bolts of the installed lock. The template can then be removed from the door edge, and, if necessary, the appropriate holes can be drilled. In some cases the door may be pre-drilled for the cylinder lock. The lock installation kit can be placed over the (pre-drilled) hole location and the door jamb marked for the striker plate installation.

[0025] Fig. 8 shows a second embodiment of a template assembly according to the invention. The end template 11 is identical to the first embodiment described above, all reference numbers are retained. The primary differences are in the configuration of the support clips 15' and the side templates 22, 23. A pair of support clips 15' are used at each free end of the side portions 13, to hold a first side template 22, and a second side template 23. The support clips are securely attached, into grooves 17' of the side templates, and are also attached to the holders 14. Guide holes 19 are provided on the side templates, and are used as described above for the first embodiment.

[0026] Fig. 9 shows a third embodiment, in side view, of a template assembly 24 according to the invention. A one-piece construction is used, having an end template 12', from which two side portions 13' emanate and which have side templates 25 extending from each of the side portions. The side templates 25 preferably have flared ends 26, to facilitate the application of the template over a door edge (not shown). Guide holes (not shown) are provided in the side templates, as described earlier, and the end template has a center hole (not shown), also as previously described. The template assembly 24 according to the third embodiment thus does not have folding side templates with support clips. Instead, it is one piece spring clip assembly that is clamped over the door edge by pushing the template over the door edge (flared ends first) to force the side portions 13' and side templates 25 apart, and retained by spring tension. The gap between the side templates 25 is smaller than the thickness of any door for which the template is intended to be used.

[0027] Fig. 10 shows a fourth embodiment of a side template according to the invention. The end template is identical to that described in relation to the first and second embodiments (see e.g. end template 11 as shown in Fig. 2). The side templates 28 are of a one-piece construction, having attachment connectors 29 formed at one end. The connectors are attachable to the holders 14 of the end template, in the same manner as the support clips

are attached in the first embodiment. Guide holes 19 are arranged in the side templates 28, and used as described above. This embodiment permits simple, one-piece construction of the side templates, which can be manufactured of a hard plastic, metal, or other suitable material.

[0028] Fig. 11 shows a fifth embodiment of a template assembly according to the present invention. End template 11 is formed as a spring clip is as described above in relation to the first two described embodiments of the template assembly. However, side templates 30 are formed of plastic and attached to support clips 15 by engagement with groove 31 formed in an extruded channel. Preferably, support clip 15 snaps into groove 31 and is retained therein. Guide holes 19 are provided in side templates 30 for marking or drilling, as described above. To shield a user from the sharp edges of end template 11, which is preferably formed of metal, non-marking protection caps 33 can be secured along the edges of jaws 13, and include pins to engage the holders 14 to limit movement of the side templates other than along the desired pivotal axis. This embodiment permits an ergonomic design of the plastic side templates, while retaining the strength of the spring clip/support clip combination. Such an ergonomic design improves grippability of the template by a user by providing an offset tip to the side templates 30, thus effectively reducing the distance between the ends of the side templates when they are folded back. This feature, therefore, also improves the ease of actuation to a user by reducing the leverage required to open the template assembly. Non-slip grips or protection caps can also be applied to the side templates, as described above in relation to the embodiment of Figs. 2 - 6. Preferably, such non-slip grips or protection caps are made of a non-marking material, such as rubber.

[0029] Figs. 12 - 14 show a further embodiment of the present invention in which the case 42 of a lock installation kit 40 also acts as a template assembly 44. As in the first described embodiment of the installation kit, a plurality of tools are contained in a tool box 2, advantageously having a hanging tab 3, or other display means. Examples of tools that can be included in the kit are a hole saw, chisel, spade drill bit 7, ordinary drill bit, set-depth drill bit 9 and pencil. Any other tool, which would be necessary for a particular hole-making project, can be included in the tool kit. All the components necessary for lock installations can thus be

stored in one convenient carrying case, with the case 42 itself providing the hole marking template.

[0030] The template assembly 44 is disengaged from kit 40. The case 42 includes an end template 46 hingedly connected to the main body of the case 42 at connection 48. The main body forms side template 47, as shown in Fig. 14. In a storage position, end template 46 is folded into a recess 50 in case 42. In an operating position, end template 46 is folded out at a 90 degree angle to side template 47. End template 46 also includes a resilient biasing means, such as single spring clip 52, attached opposite to connection 48. Side template 47 includes one or more guide holes 49, and lock height indicators 54. The lock height indicators 54 preferably include guide tabs for precise alignment of the lock. Choice of the appropriate lock height indicator depends on the width of the door on which a lock is being installed, and on the type and make of lock. It is also contemplated that guide holes 49 can include guide tabs to permit precise marking of a hole center point. End template 46 includes one or more center holes 51 for location above the center line of a door.

[0031] In the operating position, as shown in Fig. 14, the end template 46, side template 47 and spring clip 52 form a generally U-shaped assembly having a base portion formed by end template 46. The biased spring clip 52 permits the template assembly 44 to be clamped to doors of various widths. As with the previously discussed embodiments, guide holes 49 and center holes 51 are used in the operating position to enable marking or drilling of holes for installation of a chosen lock.

[0032] As will be clear to those of skill in the art, the present invention provides a simple, inexpensive door lock installation template and kit. The kit provides all the tools and the marking templates required for installation of standard or specialized locks. The lock installation template, or jig, can be used as a template to mark or drill holes for a variety of locks. The template can also accommodate doors having a variety of widths without complicated adjustment of clamps, screws or adjusting bolts. The template can be made of metal, such as spring steel, or a resilient plastic, and can integrally formed or assembled from separate pieces. In one embodiment, the lock template can form part of the lid of the lock installation kit itself, thus reducing the separate components required for the kit.

**[0033]** The above-described embodiments of the present invention are intended to be examples only. Alterations, modifications and variations may be effected to the particular embodiments by those of skill in the art without departing from the scope of the invention, which is defined solely by the claims appended hereto.